

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Original): A diagnostic system for a field device in a process control apparatus, comprising:

- at least one sensor associated with the process control apparatus;
- a computer located on the field device and adapted to receive data from the sensor and to detect an occurrence of a predetermined process event; and
- a memory device operatively connected to the computer and adapted to store sensor data received by the computer at a time corresponding to the occurrence of the predetermined process event.

Claim 2 (Original): The diagnostic system of claim 1, wherein the memory device is further adapted to store sensor data received by the computer at times prior to the occurrence of the predetermined process event.

Claim 3 (Original): The diagnostic system of claim 1, wherein the memory device is further adapted to store sensor data received by the computer at times subsequent to the occurrence of the predetermined process event.

Claim 4 (Original): The diagnostic system of claim 1, wherein the memory device is further adapted to store sensor data received by the computer at times prior to the occurrence of the predetermined process event and subsequent to the occurrence of the predetermined process event.

Claim 5 (Original): The diagnostic system of claim 1, wherein the computer is a microcontroller located on the field device.

Claim 6 (Original): The diagnostic system of claim 1, wherein the memory device is located on the field device.

Claim 7 (Original): The diagnostic system of claim 6, wherein the memory device is a non-volatile RAM.

Claim 8 (Original): The diagnostic system of claim 1, wherein the field device is a valve positioner.

Claim 9 (Original): The diagnostic system of claim 1, wherein the predetermined process event is an excessive travel deviation of a valve element.

Claim 10 (Original): The diagnostic system of claim 1, wherein the predetermined process event is a sensor signal, representing a sensed valve parameter, crossing a cutoff point.

Claim 11 (Original): A method of monitoring the performance of a process control system including at least one field device, comprising:
providing at least one sensor associated with the field device;
providing a memory device on the field device;
collecting data from the sensor;
detecting the occurrence of a predetermined process event; and
storing data on the memory device from the sensor collected at a time corresponding to the occurrence of the predetermined process event.

Claim 12 (Original): The method of claim 11 further including storing data from the sensor collected at times prior to the occurrence of the predetermined process event.

Claim 13 (Original): The method of claim 11, further including storing data from the sensor collected at times subsequent to the occurrence of the predetermined process event

Claim 14 (Original): The method of claim 11, further including storing data from the sensor collected at times prior to the occurrence of the predetermined process event and subsequent to the occurrence of the predetermined process event.

Claim 15 (Original): The method of claim 11, wherein the predetermined process event is an excessive travel deviation of a valve element.

Claim 16 (Original): The method of claim 11, wherein the predetermined process event is a sensor signal, representing a sensed valve parameter, crossing a cutoff point.

Claim 17 (Original): A field device for a process control apparatus, comprising:
at least one sensor;
a computer located on the field device and adapted to receive data from the sensor and to detect an occurrence of a predetermined process event; and
a memory device operatively connected to the computer and adapted to store sensor data received by the computer at a time corresponding to the occurrence of the predetermined process event.

Claim 18 (Original): The field device of claim 17, wherein the predetermined process event is the occurrence of a sensed parameter being out of a predetermined range.

Claim 19 (Original): The field device of claim 17, wherein the predetermined process event is the failure of a sensor.

Claim 20 (Original): The field device of claim 17, wherein the predetermined process event is a component failure.

Claim 21 (Original): The field device of claim 17, wherein the predetermined process event is a process variable change.

Claim 22 (Original): The field device of claim 17, wherein the predetermined process event is a command from a process control workstation.